Environmental Quality Board
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35 Years of Environmental Management

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Timothy Gordon
U.S. Environmental Protection Agency
RCRA Program Branch
Caribbean Section
290 Broadway, 22nd Floor
New York, NY 10002

RE: Draft Final Groundwater Baseline Investigation at U.S. Navy's Eastern Maneuver Area, Former Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico, dated May 2005

The Puerto Rico Environmental Quality Board respectfully submits to the U.S. Environmental Protection Agency the comments contained herein regarding the groundwater investigations for the Island of Vieques.

If you have any questions or comments, do not hesitate to contact me at 787-365-8573.

Cordially,

Yarissa A. Martínez León
Special Assistant

enclosure

cc:
Christopher Penny, Navy w/ enclosure
Félix López, FWS w/ enclosure
Daniel Rodríguez, EPA Vieques Field Office w/ enclosure

Dirección Física: Ave. Ponce de León, Hato Rey, PR 00918 Tel. 787-767-8181 • Fax 787-767-4861
Dirección Postal: Apartado 11488, Santurce, PR 00910

TECHNICAL EVALUATION

Draft Final Groundwater Baseline Investigation at U.S. Navy's Eastern Maneuver Area, Former Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico, dated May 2005

Prepared July 2005

I. INTRODUCTION

TRC environmental Corporation (TRC) has reviewed and provides the attached evaluation of the *Draft Final Groundwater Baseline Investigation at U.S. Navy's Eastern Maneuver Area, Former Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico*, dated May 2005 (Groundwater Baseline Report).

The Groundwater Baseline Report presents the procedures and results of the field investigations conducted as part of the groundwater baseline investigation along the western property boundary of the former Eastern Maneuver Area (EMA). The objective of the investigation is to assess water quality and groundwater flow patterns along the western perimeter of the EMA, and to determine whether activities at the former Atlantic Fleet Weapons Training Facility (AFWTF) have impacted groundwater along the western perimeter.

The scope of work for the investigation is presented in the *Final Work Plan for Groundwater Baseline Investigation at U.S. Navy's Eastern Maneuver Area, Vieques Island, Puerto Rico,* dated September 2001 (Work Plan). Numerous comments were submitted to the Navy regarding the Work Plan and many appear to have been considered during the implementation of the Groundwater Baseline investigation.

This review presents significant issues identified in the Groundwater Baseline Report.

II. GENERAL COMMENTS

1. The Navy has presented no information to verify the appropriateness of explosives analysis performed in 1999. General Comment #3 to the Work Plan requested that the Navy verify the adequacy of the 1999 analytical program by comparing comprehensive chemical composition (and by-products) for each type of munition and Unexploded Ordnance (UXO) item identified with the analyte list. Without this information, the appropriateness of the explosives analysis is undocumented and cannot be verified.

2. The Groundwater Baseline Report states that the four Resource Conservation and Recovery Act (RCRA) monitoring wells were sampled and analyzed for the Appendix IX parameters that were not analyzed for in 1999. However, none of the samples were analyzed for organophosphorous pesticides and furans (which are typically reported with the dioxins). Both of these parameters are required on the Appendix IX list. The Additional Comment #3 to the Work Plan identified this discrepancy and requested that the investigation include these analyses. The Groundwater Baseline Report should be

revised to explain why these parameters were not included with the RCRA monitoring well analyses and discuss any limitations and corrective actions.

III. PAGE-SPECIFIC COMMENTS

1. Page 1-2, Section 1.2, Paragraph 3 – The text states that Appendix A presents soil boring logs for the four RCRA monitoring wells. However, as stated in Section 3.2, boring logs do not exist for well RCRA-2. This should also be clarified in Section 1.2.

2. Page 1-3, Section 1.2 – The text states that the RCRA monitoring wells were to be sampled and analyzed for the Appendix IX parameters not sampled for in 1999. However, RCRA-1 was not sampled and analyzed for dioxins, cyanide, and sulfide, as was done for the other RCRA monitoring wells. An explanation for the lack of analyses in RCRA-1 must be provided in the text.

3. Page 2-2, Section 2.1, Paragraph 3 – The text states that the four RCRA wells from the 2004 sampling event were analyzed for Appendix IX constituents (with the exception of metals and explosives). However, well RCRA-1 was not sampled and analyzed for dioxins, cyanide, and sulfide. An explanation for the lack of analyses in RCRA-1 must be provided in the text.

4. Pages 2-2 and 2-3, Sections 2.2.3.1 and 2.2.3.2 – The wells were pumped at a rate greater than that set forth in the Region II low-flow sampling procedure (EPA, 1998). In 1999, wells were pumped with flow rates between 946 and 1,893 milliliters (mL/minute) and in 2004, wells were pumped with flow rates between 757 and 984 mL/minute. These rates are all higher than those prescribed in the EPA Region II Guidance (200-500 mL/minute). The use of high flow rates was also commented on during the review of the Work Plan (Additional Comment #4). The report should identify and explain the rationale for this deviation from EPA Region II, and describe any limitations and corrective actions.

5. Page 2-3, Section 2.2.3.2, Paragraph 6 – The text states that RCRA-4 was purged and sampled at a higher flow rate than specified in the low flow procedure. However, all wells were sampled at a higher flow rate than specified in the low flow procedure. It is unclear why only RCRA-4 is called out in this paragraph. See Comment #4 for additional concerns regarding the sample purge flow rates.

6. Page 2-6, Section 2.4.3, Paragraph 3 – The text states that a field blank was collected during each sampling event. However, page 3 and Exhibit 1 of the Data Quality Evaluation (Appendix E) do not indicate that a field blank was collected during the 2004 sampling event. Revise the text to clarify this inconsistency. Present and discuss any limitations and corrective actions associated with the noted inconsistency.

7. Page 3-3, Section 3.3, Paragraph 2 – The text states that no dioxins were detected in any of the four RCRA monitoring wells. However, there are no data presented for well RCRA-1. Exhibit 1 of Appendix E shows that no dioxin analysis was performed on a sample from RCRA-1. The text should revised accordingly. Groundwater Baseline Report should also explain the lack of dioxin data from this well.

8. Page 3-3, Section 3.3, Paragraph 3 – The metals results flagged with "B" were used in the evaluation of Preliminary Remediation Goal (PRG) exceedances for the NW-series wells. The results flagged with a "B" were not used in the evaluation of PRG exceedances for the RCRA wells. The "B" flag for metals results indicates that the result is detected below the reporting limit but above the instrument detection limit and is comparable to a "J" flag for organic results. The results flagged with a "B" should be consistently used for all wells when comparing results to PRGs.

9. Page 3-3, Section 3.3, Paragraph 3 –, According to the Appendix H,.Vanadium exceedances were also detected in NW-1, NW-3, NW-4, NW-6, and NW-7. The text should be expanded.

10. Page 3-3, Section 3.3.1.2, Bullet 2 – The EPA Region IX PRGs-R (0.617 micrograms per liter (ug/L)) is from the 2002 values and should be updated to the October 2004 values. The current PRG (EPA, 2004) for chloroform is 0.17 ug/L and should be cited in the text.

11. Page 3-3, Section 3.3.1.2, Paragraph 2, and Page 4-1, Section 4, Paragraph 4 –Provide additional lines of evidence to support the hypothesis that the bromodichloromethane and chloroform detections represent disinfection byproducts. A map of the existing municipal water service north of RCRA-3 and tabulated monthly usage records showing volume lost would be helpful. The statement that RCRA-3 is downgradient from residences is not supported by information in Figure 1-2 and Figure 3-4. According to Figure 3-4, the area north-northeast of RCRA-3 occupies an upgradient position. According to Figure 1-2, there is only one building in the area generally upgradient of RCRA-3 and that single building may occupy a cross-gradient position.

12. Page 3-4, Table 3-1 –
    a. For the listed metals results, empty spaces should be replaced with the detected concentrations that were flagged with a "B", as discussed in Page-Specific Comment Number 8 above).
    b. The EPA Region IX PRG-R listed for vanadium (25.5 ug/L) is from the 2002 version of the PRGs. The EPA Region IX PRGs were updated in October 2004. The new tapwater PRG for vanadium is 3.6 ug/L and should be cited in the table.
    c. The use of the updated PRG for vanadium will result in exceedances at RCRA-2 and RCRA-4 for dissolved metals and at RCRA-2, RCRA-3, and RCRA-4 for total metals. Therefore, the reporting of metals results flagged with a "B" is critical to this evaluation.
    d. Table 3-1 is a summary of detected results. The results for copper and nickel under dissolved metals and chromium, copper, nickel, and selenium under the total metals must be added. These metals were detected in select wells and flagged with a "B" and therefore must be added to this table.
    e. The EPA Region IX PRG-R listed for chloroform (0.617 ug/L) is from the 2002 version of the PRGs. The EPA Region IX PRGs were updated in October 2004. The new PRG for chloroform is 0.17 ug/L and should be cited in the table.
    f. The table reports sulfide as not detected (ND) in sample RCRA-1. However, sulfide analysis was not performed on this sample. Exhibit 1 of Appendix E also shows that

g. sulfide analysis was not performed in this well. Therefore, the ND result should be replaced with NA (not applicable).
h. The definition for the "B" qualifier at the bottom of the table must be changed to "Reported value is less than the required reporting limit but greater than or equal to the instrument detection limit."
i. The reference to the EPA Region IX PRGs at the bottom of the table should cite the most recent version (October 2004).

13. Page 3-4, Section 3.3.1.3 – Provide an explanation/rationale for not analyzing samples from RCRA-1 for cyanide and sulfide. These analysis were performed in the other RCRA series wells.

14. Page 4-1, Section 4 – The final sentence should be removed to avoid potential misunderstanding. Data from four wells is insufficient to support conclusions regarding the status of impacts from military activities on groundwater quality.

15. Appendix A and Appendix B – Review and revise inconsistencies in boring logs and well completion logs. For example, the boring log for RCRA-1 in Appendix A indicates a screen depth ranging from 55 to 65 feet below ground surface (bgs) whereas the Appendix B construction log states the screen depth for the same well ranges from 54 to 64 feet bgs. In addition, the Appendix A boring log for P-2 indicates a screen depth from 93.5 to 103 feet bgs and Appendix B construction log states screen depth from 92 to 102 feet bgs. The Appendix A boring log for P-8 indicates screen depth from 10.5 to 30 feet bgs and Appendix B construction log states the screen depth ranges from 12 to 32 feet bgs. The Appendix A boring log for P-9 indicates the boring was terminated at depth 25 feet bgs and the Appendix B construction log indicates a screen depth from ranging 70 to 80 feet.

16. Appendix D, Groundwater Sampling Data Sheets – Provide the following additional information as set forth below:
    a. RCRA-2: For clarity, provide the depth to which the pump was set.
    b. RCRA-3: The dissolved oxygen readings had not stabilized to ±10% over 3 readings as stated in Section 2.2.3.2 of the document. Per EPA 1998 guidance, provide an explanation as to why this parameter was not allowed to stabilize prior to collecting that sample. Describe any limitation or necessary corrective actions resulting from this action.
    c. RCRA-3: The data sheet states that the pump was set at 69 feet below top of casing (btoc). However, the total depth of the well was 70.23 ft btoc, which suggests that the pump was not placed in the middle of the screen as set forth in the EPA Region II Low Flow Guidance. The text should explain the rationale for any deviations from guidance or protocols.
    d. RCRA-4: For clarity, the depth that the pump was set must be recorded.

17. Appendix E, Data Quality Evaluation – Clarify the following:
    a. Page 1, Bullet 6: Clarify whether the laboratory reported total or amenable cyanide.
    b. Page 1, Bullet 7: Provide the method used for the analysis of sulfide.

c. Exhibit 4: Clarify why none of the samples were qualified due to the concentration of sulfide detected in the equipment blank (1120 ug/L). This concentration was comparable to all detected concentrations in the samples that are currently reported as PRG exceedances. These exceedances may be due to blank contamination.

18. Appendix G, RCRA Monitoring Well Results –
    a. Provide an explanation in Section 2 and/or 3 of the report as to why results for dioxins, cyanide, and sulfide were not presented for sample RCRA-1.
    b. Results for the volatile organic compounds (VOCs) acetonitrile, 1,4-dioxane, and isobutyl alcohol were rejected in all of the RCRA monitoring well samples. The Additional Comment #7 to the Work Plan noted that SW-846 method 5030B/8260B was not appropriate for these compounds. As noted in the comment, SW-846 8015 (direct aqueous injection) should have been used for the analysis of these compounds. The use of a more appropriate method would have resulted in usable data. Explain why the appropriate method was not used.

19. Appendix H, NW Monitoring Well Results –
    a. Summary of Inorganic Constituents Detected for Total Metals: The PRG for tin must be included on this table. In addition, The EPA Region IX PRG-R listed for vanadium (25.5 ug/L) is from the 2002 version of the PRGs. The EPA Region IX PRGs were updated in October 2004. The new PRG for vanadium is 3.6 ug/L and should be cited in the table. (See comment No. 9)
    b. Summary of Inorganic Constituents Detected for Total Metals: The new PRG for vanadium will result in new exceedances at NW-1, NW-3, NW-4, NW-6, and NW-7. (See comment No. 9)
    c. Summary of Dissolved Inorganic Constituents Detected: The PRG for tin must be included on this table. In addition, The EPA Region IX PRG-R listed for vanadium (25.5 ug/L) is from the 2002 version of the PRGs. The EPA Region IX PRGs were updated in October 2004. Cite the up to date PRG for vanadium (3.6 ug/L) in the table.
    d. Summary of Dissolved Inorganic Constituents Detected: Using the 2004 PRG for vanadium will result in exceedances at NW-3, NW-4, NW-6, NW-7, and NW-8. Update the summary accordingly.

IV REFERENCES

CH2MHill, 2001. Final Work Plan for Groundwater Baseline Investigation at U.S. Navy's Eastern Maneuver Area, Vieques Island, Puerto Rico. September.

EPA, 1998. Groundwater Sampling Procedure Low Stress Purging and Sampling, Region 2 Standard Operating Procedure. Final report. March.

EPA, 2004. Region 9 Preliminary Remediation Goals (PRGs). www.epa.gov/region09/waste/sfund/prg/index.html